

400 W Stirling Convertor for kW-Class Space Power System, Phase I

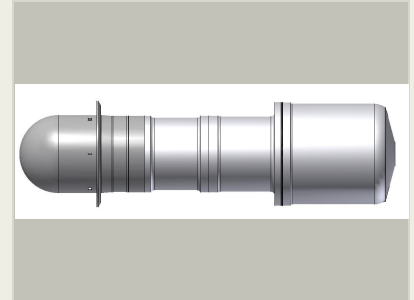
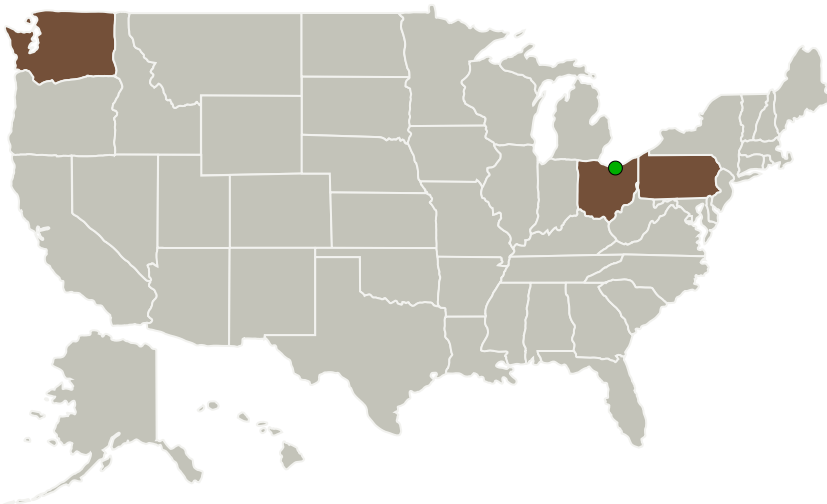
Completed Technology Project (2016 - 2017)



Project Introduction

SCCAQ Energy, LLC (SCCAQ), in collaboration with Temple University and Infinia Technology Corporation (ITC), is pleased to propose a Stirling Kilopower Innovative Prototype (SKIP) that is ideally suited for use with fission-based Space Nuclear Power Systems (SNPS) and/or Nuclear Electric Propulsion (NEP) systems. SKIP adapts the ongoing development of a 400-W free-piston Stirling (FPS) engine for terrestrial applications to meet NASA needs for SNPS. This proposal is specifically addressed to STTR Topic T3 (Space Power and Energy Storage), with an emphasis on Subtopic T3.01. The proposed effort will be supported by Temple University SEEE lab personnel and will heavily leverage engineering support from Infinia Technology Corporation (ITC). This proposal is based on adapting newly developed 400-W engine at ITC to current NASA needs for an extremely reliable, robust, and high performance space power engine for Kilopower fission thermal conversion, among other potential power system heat sources. The key change that is needed to develop a SKIP demonstration unit is to modify the heater head to be suitable for interface with a space reactor system as a heat source.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
SCCAQ Energy, LLC	Lead Organization	Industry Minority-Owned Business, Women-Owned Small Business (WOSB)	Richland, Washington
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
Temple University	Supporting Organization	Academia	Philadelphia, Pennsylvania

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

SCCAQ Energy, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

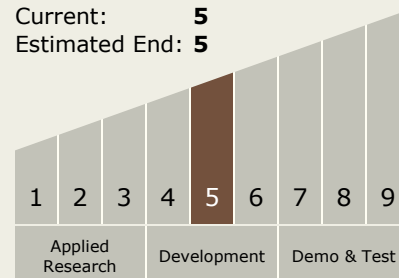
Carlos Torrez

Principal Investigator:

Songgang Qiu

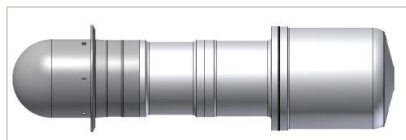
Technology Maturity (TRL)

Start: 5
 Current: 5
 Estimated End: 5



Primary U.S. Work Locations	
Ohio	Pennsylvania
Washington	

Images

**Briefing Chart Image**

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 (<https://techport.nasa.gov/image/134602>)

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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System